

### **REMARKS**

Claims 15 and 17-26 are active in the case. Reconsideration is respectfully requested.

The present invention relates to an abrasive sheet that is used in the texturing of the surfaces of magnetic recording media.

#### **Claim Amendment**

Claim 15 has been amended by incorporating the phrase of texturizing the substrate surface of a magnetic recording medium in a pattern of groove-like fine unevenness with a mean surface roughness (Ra) of not more than 1 nm. This is done by contacting the surface of the substrate after it has been polished by contact of the surface with an entangled ultrafine fiber non-woven fabric made as described in the claim. Support for the limitation can be found on page 8 for example. Accordingly, the amendment does not introduce new matter into the case and entry of the amendment into the record is respectfully requested.

#### **Prior Art Rejection**

Claims 15-26 stand rejected based on 35 USC 103 as obvious over Owaki, U. S. Patent 5,226,955 in view of Ashida et al, U. S. Patent 5,503,899. This ground of rejection is respectfully traversed.

As has been stated previously, the Owaki patent discloses a polishing composition for the polishing of the surfaces of memory hard discs, and for that purpose, the patent in column 3 discloses a polishing pad, which is a "suede" type polishing pad, that is employed in the polishing machine that is described in Embodiment 1. No details of the polishing pad are

provided in the patent as to how the pad is formed and the physical characteristics of the surface of the suede pad that allow its favorable use in the polishing machine that is disclosed. However, it is important to note that the patent discloses the use of the pad as a polishing pad which means that the pad is employed with a polishing composition, as described in Embodiment 1, to produce a polished mirror surface on the substrate surface. This operation, however, is **not** the texturizing operation of the present claims. As is well known in the art, texturizing is a common procedure that is employed in which a desired pattern of groove-like fine unevenness is formed on the surface of a nonmagnetic disk substrate as described on page 2 of the specification. The purpose of texturizing the substrate surface is to form uniform and fine unevenness in the thin film magnetic disk surface that is layered on the substrate. The results in the effect of preventing disc surface damage upon head crash or sticking of a magnetic head to the disc surface and the effect of increasing the coercive force in the direction of the recording as a consequence of controlling the directionality of crystal growth when a metallic magnetic layer is formed on the disc substrate with a non-magnetic layer formed thereon. The difference between a polished mirror surface and a surface having a pattern of fine groove-like unevenness is shown in the attached pages. Clearly, the distinct difference between surface polishing that is taught by Owaki and the texturizing process of the present invention means that even upon combination with of Owaki with Ashida et al, nothing with regard to surface texturizing is suggested.

Applicants maintain their previous position as stated with respect to the Ashida et al patent, because of its disclosure of a suede-like material, which is alleged to be useful as a suede polishing pad in the device described by Owaki. The suede-like material, as described in

the abstract, for instance, is comprised of fiber bundles and an elastomeric polymer, wherein the fiber bundles are comprised of fine fibers (A) that have a fineness of 0.02-0.2 denier and microfine fibers (B) having a fineness of not more than 1/5 of the average fineness of fine fibers (A). However, there is no description in the Ashida et al patent of the use of the suede material as a polishing pad material. Rather, the sole utility of the suede material of the reference is as an artificial leather for the manufacture of such articles as clothing, pouches, shoes and the like (the paragraph bridging cols 7 and 8). Moreover, there is no teaching or suggestion of a suede material whose elastomer material is a high-molecular weight elastomer having a wet elastic modulus of 0.05 to 0.95 kg/mm<sup>2</sup> and where, in the cross-section of the sheet to a depth of about 1/3 in the thickness direction from the napped surface of the sheet, the ultrafine fibers (A) constituting the portions of the sheet other than the napped portions have a fineness of not more than 0.1 dtex. These characteristics of the present suede-like sheet that is used as a polishing pad material are important. As stated on page 25 of the specification, if the wet elastic modulus of the elastomer is less than 0.05 kg/mm<sup>2</sup>, the strength of the elastomer sheet becomes insufficient, while if the wet elastic modulus of the elastomer is greater than 0.95 kg/mm<sup>2</sup>, the cushioning properties of the abrasive sheet become insufficient for the use of the sheet in texturing the surface of the magnetic recording medium and the effect of preventing the ultrafine fibers from being dislodged from the sheet during texturing unfavorable diminishes. As to the requirement of the present claims that the ultrafine fibers (A) that constitute the portions of the sheet other than the napped portions have a fineness of not more than 0.1 dtex relative to the depth of the sheet of about 1/3 in the thickness direction from the napped surface of the sheet, if the fineness of fibers (A) exceeds 0.1 dtex, the nonwoven fabric surface

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Amendment under 37 CFR 1.114

smoothness becomes insufficient and consequently the smoothness of the abrasive sheet becomes insufficient and the friction against the surface of the disk surface in the texturing thereof becomes excessively strong and processing precision diminishes. Moreover, the comparative evidence in the examples of the present specification demonstrate the importance of the maximum fineness of the ultrafine fibers (B) of the present material as it influences the quality of the texturizing process. Accordingly, the combined patents do not lead the skilled artisan to the texturizing operation, and therefore, withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for consideration on its merits.

Respectfully submitted,

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MAIER & NEUSTADT, P.C.  
Norman F. Oblon

A handwritten signature in black ink, reading "FD Vastine". The signature is written in a cursive, flowing style.

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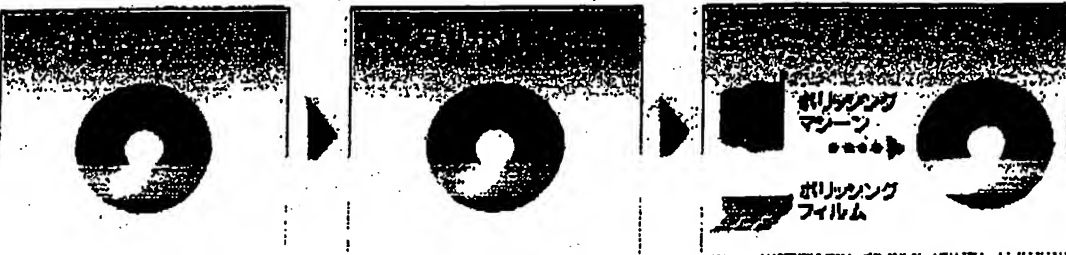
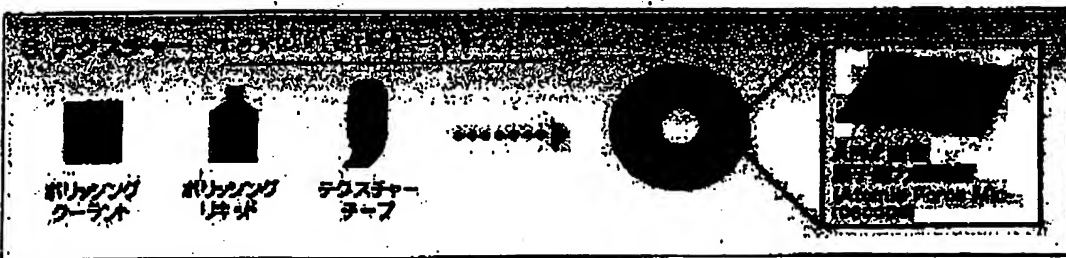
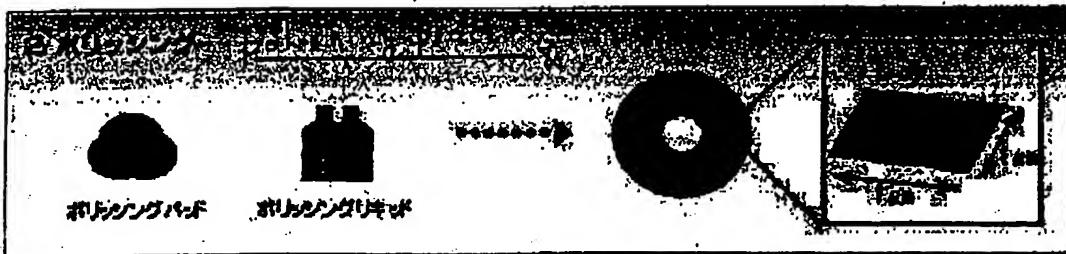
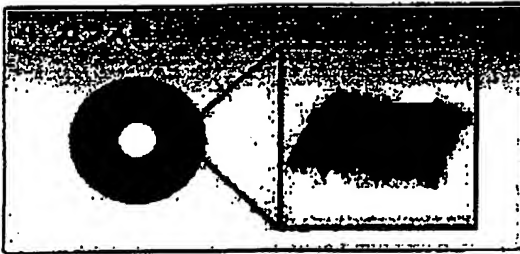


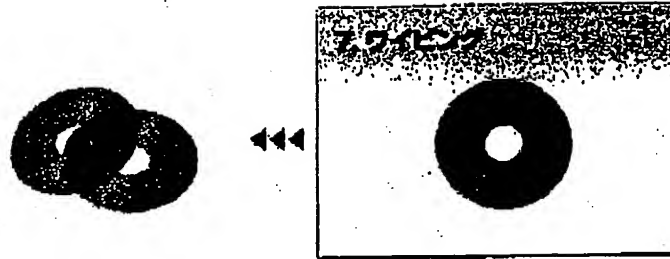
## 会社案内

### ハードディスク. Hand disk

弊社はハードディスクの表面加工を30年以上手がけております。弊社が強いところは、ハードディスクの表面に超微細な溝加工をするテクスチャー工程で使われる液体研磨剤（ポリッシングリキッド）であり、特にガラス基板のハードディスク用液体研磨剤のシェアは世界No.1です。

ガラス基板のハードディスクでは、弊社の製品はこんなところに使われています。





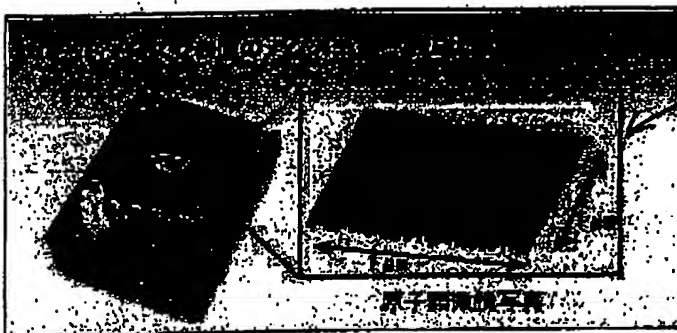
### ■ ガラス基板ハードディスクへのダイレクト・テクスチャー

ハードディスクの高容量化に伴い、従来からアルミ基板の表面にはテクスチャー加工を行っていましたが、ガラス基板には不要とされていました。しかしながら、ハードディスクドライブメーカーはハードディスクの小型化と更なる高容量化を具体化するために、ガラス基板にもテクスチャー加工を採用することとなりました。従来のガラス基板テクスチャー加工は、ガラスの上にニッケルリンのメッキを行った後、テクスチャー加工を行うプロセスでしたが、当社はガラス基板にダイレクト・テクスチャー加工が出来るポリッシングリキッド(スラリー)を開発し、その他消耗品と共に提供しております。

### ■ テクスチャー加工

基板の表面に均一な溝を形成するプロセスで、微細な表面加工を行うものです。基板表面に溝をつけるのは、主に以下のためにおこなわれております。

- (1) 記憶容量を高める
- (2) ヘッドの基板吸着防止



*groove-like fine uneven surface*